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PATENT

Inventor: Arye Malek et al.

Serial No.: 09/350,251


Filed: July 8, 1999

Title: TRAY FLIPPER AND METHOD FOR PARTS INSPECTION

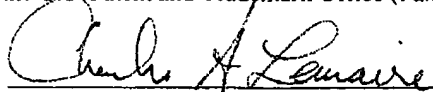
Examiner: John Q. Nguyen

Group Art Unit: 3653

Docket: 139.059US1

By: 
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CENTRAL FAX CENTER****S/N 09/350.251****MAY 19 2005****PATENT****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appellant:	Arye Malek et al.	Examiner:	John Nguyen
Serial No.:	09/350,251	Group Art Unit:	3653
Filed:	July 08, 1999	Docket:	139.059US1
Title:	TRAY FLIPPER AND METHOD FOR PARTS INSPECTION		

**APPEAL BRIEF TO THE BOARD OF
PATENT APPEALS AND INTERFERENCES OF THE
UNITED STATES PATENT AND TRADEMARK OFFICE****MAIL STOP APPEAL BRIEF - PATENTS**

Commissioner for Patents
P.O Box 1450
Alexandria, VA 22313-1450

Appellant's Brief on Appeal

This brief is presented in support of the Notice of Appeal filed on December 10, 2004 and received by the Office December 15, 2004, from the final rejection of pending claims 3-10, 12-21, 27-30, 37-40, 42, 43, 45, 46, and 48 of the above-identified patent application. The Final Office Action from which Appellant appeals was mailed June 10, 2004.

Appellant respectfully requests reversal of the Examiner's rejection of pending 3-10, 12-21, 27-30, 37-40, 42, 43, 45, 46, and 48. This Appeal Brief is in support of a reinstatement of appeal, since the Examiner withdrew the first rejection and reopened prosecution after Applicant's first appeal. It is believed that no further fee is due under in 37 C.F.R. § 41.20(b)(2) since Applicant paid such a fee with the first Appeal Brief filed September 22, 2003 and the issues, if changed, were changed by the Examiner who reopened prosecution after appeal (see MPEP 1208.02); however, if an additional fee for this or for any other reason is deemed to be due, such fees may be charged to Deposit Account No 502931.

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Real Party in Interest

The present patent is assigned to Charles A. Lemaire, a person residing at 13195 Flamingo Court, Apple Valley, MN 55124, in an Assignment from PPT Vision Inc., filed for recordation on November 3, 2004 and recorded on Reel 015961 Frames 0596-0597, which in turn was from an assignment from the inventors recorded on October 8, 1999, Reel 010306 Frames 0875-0878.

Related Appeals and Interferences

There are no other appeals or interferences known to Appellant which will have a bearing on the Board's decision in the present appeal.

Status of Claims

Claims 3-10, 12-21, 27-30, 37-40, 42, 43, 45, 46, and 48 are pending in this application. None of the claims are allowed. Claims 1-2, 11, and 26 are cancelled. Claims 3-10, 12-21, 27-30, 37-40, 42, 43, 45, 46, and 48 are presently rejected, and claims 22-25, 31-36, 41, 44, and 47 are withdrawn and all these are the subject of the present appeal.

Status of Amendments

Per an Advisory Action dated September 30, 2004, claims 3-10, 12-21, 22-25, 27-30, 31-36, 37-40, 41, 42, 43, 44, 45, 46, 47 and 48 were entered.

Summary of the Claimed Subject Matter

The present application is directed to a system and method for flipping a tray of parts in a machine-vision system such that opposing sides of the parts may be examined; wherein the trays are moved through the flipping station substantially parallel to their short dimension (perpendicular to their long dimension). Trays of devices, such as trays of semiconductor chips, associated with current vision inspection systems can be inspected on their first side (e.g., with connectors facing upwards), then the devices flipped by placing an empty tray upside-down over a tray full of devices, and inverting the trays while holding them together to simultaneously invert all devices, then removing the original lower tray so that the second side of the devices

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(e.g., with connectors facing downwards) can be inspected. In some prior-art systems, the flipping of trays of devices is done manually by an operator. In Jackson, an automated flipper is described, however the path through the flipper machine is long since the trays are moved in a direction parallel to their long dimension, and the fastest speed/throughput possible is thus relatively slow. The devices will be jostled out of their pockets in the tray if accelerated or stopped too rapidly. This acceleration limit limits the speed of the trays and the minimum time to move trays into and out of the Jackson flipping station. Since the trays are moved in a direction parallel to their long dimension, there can be fewer trays in a given path length, reducing throughput for any given speed used to move trays along that path. Further, the devices exit the Jackson flipping station in a different tray than the one they started in, thus losing the association between markings on the tray and the devices in the tray.

In contrast, the present invention provides (e.g., linking claim 40)

40. A machine-vision system for inspecting a plurality of tray-held devices, each device having a first side and a second side, the machine-vision system comprising:

a first inspection station for inspecting a first side of the devices held in a tray that has a long-dimension side and a short-dimension side;

a second inspection station for inspecting a second side of the devices; and

a tray-transfer device that operates to **invert the devices and move the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long dimension side of the tray** so as to reduce the distance of movement needed.

(bold emphasis added)

Claims 3-10, 12-21, 27-30, 37-39, 42, 43, 45, and 48 describe apparatus and methods that use a second tray, and change the devices from a first to the second tray when flipping the devices, while moving the trays along their shorter dimension. (Page 69, lines 6-10, Figure 16; Figure 18A, 18B, *see also* page 59 lines 18-21; page 67 lines 16-22; pages 73-74, lines 2-24 & lines 6-14 respectively; and Figures 19A & 19B (disclosing means or step-plus function and structure).)

Claims 22-25, 31-36, 41, 44 and 47 describe apparatus that do not require a second tray, but place the devices back into the first tray after flipping the devices. (Page 70, lines 16-19,

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Figures 19C-19L; *see also* pages 73-74, lines 2-24 & lines 6-14 respectively; and Figures 19A & 19B (disclosing means or step-plus function and structure).)

Claims 43 and 46 do not specify either of the conditions above and are generic to both. (Page 70, lines 22-23; *see also* Pages 73-74, lines 2-24 & lines 6-14 respectively, Figures 19A & 19B (disclosing means or step-plus function and structure).)

Grounds of Rejection to be Reviewed on Appeal

1. Whether claims 22-25, 31-36, 41, 44, and 47 were properly withdrawn as being drawn to a non-elected species, and whether there was an allowable generic of linking claim.
2. Whether claims 12, 20, 21, and 40 were properly rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.
3. Whether claims 3-9, 12-21, 27-30, 37-40, 42, 43, 45, 46, and 48 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art [discussed on pages 2-5 of the specification] in view of Jackson et al. (U.S. 6,139,243).
4. Whether claims 10 and 37-39 were properly rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art in view of Jackson et al. (U.S. 6,139,243) as applied to claims 3-9, 12-21, 27-30, 40, and 42, and further in view of Bilodeau (US 5,691,810).

Arguments**Withdrawal of Claims as drawn to non-elected species**

In the Restriction Requirement mailed September 4, 2002, the Examiner requested election of one of the following species:

- I. Figs. 19A and 19B;
- II. Figs. 19C-19L.

Applicant elected species I, and added claim 40, which reads on both species, as a generic and linking claim. Applicant filed a paper January 27, 2003, identifying claims 3-21, 27-30, 37-40, and 42 as reading on the elected species.

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Claims 22-25, 31-36, 41, 44, and 47 were withdrawn by the Examiner as being drawn to a non-elected species. Applicant respectfully traverses.

Claim 41, withdrawn by the Examiner, is dependent upon claim 40, which is not withdrawn nor restricted. Generic claim 40 reads on the withdrawn independent claims 22 and its dependent claims 23-25 and 31, and independent claim 32 and its dependent claims 33-36. Applicant traversed the non-allowance of claim 40. Accordingly, under MPEP 818.03(d), once claim 40 is held allowable, these claims should not be withdrawn, and reconsideration and allowance of the claims is respectfully requested.

Claims 44 and 47, withdrawn by the Examiner, are dependent upon claims 43 and 46, respectively, which are not withdrawn or restricted.

Further, generic claims 43 and 46 read on the withdrawn independent claims 22 and its dependent claims 23-25 and 31, and independent claim 32 and its dependent claims 33-36. Applicant traversed the non-allowance of claim 43. Accordingly, under MPEP 818.03(d), once claim 43 is held allowable, these claims should not be withdrawn, and reconsideration and allowance of the claims is respectfully requested.

Rejection under 35 U.S.C. § 112 Paragraph 2***1) The Applicable Law for Rejections under 35 U.S.C. § 112 Paragraph 2***

35 U.S.C. § 112 paragraph 2 provides "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention."

The MPEP provides:

2173.02 Clarity and Precision

The examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. 112, second paragraph is whether the claim meets the threshold requirements of clarity and precision, not whether more suitable language or modes of expression are available. When the examiner is satisfied that patentable subject matter is disclosed, and it is apparent to the examiner that the claims are directed to such patentable subject matter, he or she should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness. Some latitude in the manner of

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expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire. Examiners are encouraged to suggest claim language to applicants to improve the clarity or precision of the language used, but should not reject claims or insist on their own preferences if other modes of expression selected by applicants satisfy the statutory requirement.

The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph. See, e.g., *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 USPQ2d 1279, 1283 (Fed. Cir. 2000). See also *In re Larsen*, No. 01-1092 (Fed. Cir. May 9, 2001) (unpublished) (The preamble of the Larsen claim recited only a hanger and a loop but the body of the claim positively recited a linear member. The court observed that the totality of all the limitations of the claim and their interaction with each other must be considered to ascertain the inventor's contribution to the art. Upon review of the claim in its entirety, the court concluded that the claim at issue apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, paragraph 2.). If the scope of the invention sought to be patented cannot be determined from the language of the claims with a reasonable degree of certainty, a rejection of the claims under 35 U.S.C. 112, second paragraph is appropriate. *In re Wiggins*, 488 F.2d 538, 179 USPQ 421 (CCPA 1973).

2) *The 35 U.S.C. § 112 Rejection of Claims*

In the Final Office Action mailed 6/10/2004, the Examiner asserted that "It is not clear how moving the tray in the claimed perpendicular direction reduces the travel distance as claimed

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(claims 12, 20, 21, 40)." The test for clarity under § 112 is whether the claims apprise one of an ordinary level of skill in the pertinent art at the time the invention was made, of the scope of the claim, in view of the content of the particular application disclosure, and the teachings of the prior art. It is clear from the specification and the claims, as well as from the explanations provided in each of Applicant's prior responses, that moving the trays in the claimed perpendicular direction reduces the travel distance and/or shortens the time needed to move the trays, since the stations can be placed closer to one another, and/or more trays can be placed in the path of travel, since the trays need only be moved a distance equal to their short dimension between each operation. If stations are kept a fixed distance apart, there can be more trays along the path between machines, and thus the time per tray is reduced at a given tray speed. If the stations are moved closer together as allowed by the perpendicular orientation of the trays, the distance traveled by the tray is reduced, and thus the time per tray is reduced at a given tray speed.

For example, by moving one or more devices in a tray having a long-dimension side and a short-dimension side from the first inspection station to the second inspection station in a direction perpendicular to the long-dimension side, the invention allows (but does not require) the stations to be placed closer together, which allows one to thus reduce the travel distance and tray-transfer time, as compared to a system that moved the trays in a direction parallel to the long-dimension side. If, whichever orientation the trays are in, the trays are moved ten centimeters from one station (e.g., inspection, flip, and inspection) to the next, it would not matter to the distance which direction the trays were moved; however, if the trays were 10 centimeters wide by 20 centimeters long, the stations would each need to be spaced 20 centimeters or more apart to move the trays parallel to the 20-centimeters long dimension, but could be placed as close as 10 centimeters apart if the trays are moved perpendicular to the long dimension. When the trays are moved parallel to their long dimension, they must be moved at a speed of 20 cm per unit time (i.e., the time to move the trays from one station to the next), as compared to 10 cm per unit time (half the speed) when moving the trays parallel to their short dimension. Alternatively, if the stations are placed 200 centimeters apart, there can be only ten trays in the path between stations if placed and moved parallel to the 20-centimeter long

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dimension, but twenty trays can be placed in the path between stations if oriented and moved parallel to the 10-centimeters short dimension. These advantages and their explanation need not be recited in the claim. It is sufficient that each claim clearly defines the scope of the invention in a manner that clearly distinguishes the invention from the prior art. The claims clearly do this: they define that the trays move parallel to their short dimension, which distinguishes the claimed subject matter from the prior art that moved the trays parallel to their long dimension.

The claims do clearly recite the orientation of the tray relative to its direction of travel. Thus, one of an ordinary level of skill in the pertinent art at the time the invention was made is clearly apprised of the scope of the claim. It is respectfully requested that the rejection be reversed and the claims allowed.

Rejection Under 35 U.S.C. § 103(a)***1) The Applicable Law for Rejections under 35 U.S.C. § 103***

According to *M.P.E.P.* § 2141, which cites *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 U.S.P.Q. 182, 187 n.5 (Fed. Cir. 1986), the following tenets of patent law must be adhered to when applying 35 U.S.C. § 103. First, the claimed invention must be considered as a whole. Second, the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination. Third, the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. Fourth, obviousness is determined using a reasonable expectation of success standard. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. *M.P.E.P.* § 2141 (citing *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966)).

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference

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teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). The references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *M.P.E.P.* § 2142 (citing *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)). In considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom. *M.P.E.P.* § 2144.01 (citing *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968)). However, if the proposed modification would render the prior-art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *M.P.E.P.* § 2143.01 (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)).

In order to take into account the inferences which one skilled in the art would reasonably make, the examiner must ascertain what would have been obvious to one of ordinary skill in the art at the time the invention was made, and not to the inventor, a judge, a layman, those skilled in remote arts, or to geniuses in the art at hand. *M.P.E.P.* § 2141.03 (citing *Environmental Designs, Ltd. v. Union Oil Co*, 713 F.2d 693, 218 USPQ 865 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984)).

The examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon applicant's disclosure is often difficult to avoid due to the very nature of the

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examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

M.P.E.P. § 2141.03.

2) *The 35 U.S.C. § 103 Rejection of Claims*

Claims 3-9, 12-21, 27-30, 40, 42, 43, 45, 46, and 48

Claims 3-9, 12-21, 27-30, 40, 42, 43, 45, 46, and 48 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art [discussed on pages 2-5 of the specification] in view of Jackson et al. (US 6,139,243). Applicant respectfully traverses. To show obviousness under § 103, the burden is on the Examiner to show that, considering the claimed invention as a whole and considering the references a whole, that the references suggest the desirability and thus the obviousness of making the combination; further, the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. *Hodosh, supra*. Neither Jackson nor Applicant's discussion of the prior art provide any previous recognition of a need for, or the desirability of, moving trays parallel to their short dimension rather than parallel to the long dimension of the tray.

Claim 3 and its dependent claims

It is only with the teaching of the present disclosure that this improvement is provided. Applicant's specification has provided substantial and adequate teaching to provide one of skill in the art a full and complete understanding of the advantages of the claimed invention over the prior art. The prior art is not capable of such advantages. The cited prior art (Jackson) moves the trays parallel to their long dimension. There is no recognition that such an orientation leads to longer distances than possible with the present invention.

The non-obviousness of the present invention is further evidenced by the Examiner's failure, in earlier Office Actions, to appreciate that moving the trays in a direction parallel to their short dimension would lessen the distance needed to move trays between stations (since the

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stations could be placed closer to one another) or the per-tray travel time between inspections at a given tray speed (if the stations are kept at a fixed distance apart and more trays are placed along the path between stations). See the Examiner's arguments relative to the *§ 112 Rejection* in the Office Action mailed April 15, 2003 and in the Office Action mailed June 10, 2004.

Further, the Examiner analogizes that, because the distance of travel between two cities cannot be reduced by traveling in a shorter car, Applicants cannot assert that the claimed perpendicular direction reduces the travel distance between inspection stations; this analogy is not applicable to the present application. Cities are not moved closer together because shorter cars are used in traveling between them; however, inspection stations can be placed closer together by shortening the trays moving between the stations. Further, if shorter cars were used on the highway between the Examiner's hypothetical two cities, then for any given spacing between cars (say zero feet/bumper-to-bumper for very slow traffic, or, e.g., 100 feet between the back of one car and the front of the next car, for cars traveling 60mph) and for any given speed, more cars travel between the two cities in each hour (i.e., providing higher throughput). Unlike cities, which cannot be moved, inspection stations in a machine-vision system can be easily moved and reconfigured to take advantage of moving trays in their short dimension. Just because it is easy to do so, does not mean that it is obvious to do so. Further, Applicant's recitation of the movement relative to the short-dimension direction or the long-dimension direction clearly distinguishes the claimed invention from the cited prior art, without the need to further recite in the claims the advantages obtained by the claims as recited.

The Examiner's dismissal of tray orientation as a matter of design choice to one of skill in the art based on criteria such as space optimization is only possible after absorbing the teaching of the present application. Based on the Examiner's own reasoning that orientation of the trays does not affect the distance traveled, the orientation of the trays would not affect the space needed: three trays oriented with their long dimension in the direction of travel take the same area as three trays oriented with their short dimension in the direction of travel. It is only with Applicant's teaching that any such problem (such as shortening the distance of tray travel between stations, or shortening the overall length of the machine in the direction of travel) and

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solution is provided. There is no indication in Jackson of a desirability to move the trays along the short dimension.

Jackson moves the trays along the tray's long dimension (note Jackson Fig.1 where the axis of rotation 42 is parallel to the direction of tray travel shown by the arrow, and Fig. 4 where the axis of flip rotation 42 is parallel to the long dimension of the tray), thus increasing the time needed to transfer the trays to and from the flip station. In contrast, the present claimed invention of claims 3, 12, and 20 as amended, and their respective dependent claims recite moving the trays (to or from the flip station) in a direction perpendicular to the long-side dimension or parallel to the short-side dimension of the tray. This short-dimension movement reduces the time of travel, shrinks the footprint size of the conveyor needed, and reduces the jostling and shaking of the devices in the tray due to fast start and stop motions if the trays were moved in the long dimension in the same amount of time (if the devices are moving when moved to the second inspection time due to jostling in the trays, extra time must be wasted to wait for the devices to stop moving so a picture can be taken). Accordingly, claims 3, 12, 17, 20 and 40 and their dependent claims appear in condition for allowance and reversal of the rejection is respectfully requested.

Claim 9

Claim 9 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art [discussed on pages 2-5 of the specification] in view of Jackson et al. (US 6,139,243). Applicant respectfully traverses. The Examiner has failed to show any structure equivalent to the description in the present application for a means for moving the second inspection station with respect to the inverting mechanism. Reversal of the rejection is respectfully requested.

Claim 13

Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art [discussed on pages 2-5 of the specification] in view of Jackson et al. (US 6,139,243). Applicant respectfully traverses. The Examiner has failed to show a first tray-

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transfer device for holding at least the first tray, said first tray-transfer device moving the first tray from the first inspection station to the flip station; and a second tray-transfer device for holding at least the second tray, said second tray-transfer device moving the second tray from the flip station to the second inspection station. Reversal of the rejection is respectfully requested.

Claim 14

Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art in view of Jackson et al. (US 6,139,243). Applicant respectfully traverses. The Examiner has failed to show a mechanism for flipping the devices carried in a tray, the mechanism further comprising means for limiting the motion of the rotator. Reversal of the rejection is respectfully requested.

Claim 17

Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art in view of Jackson et al. (US 6,139,243). Applicant respectfully traverses. The Examiner has failed to show a flipping mechanism for transferring a plurality of devices from a position in a first tray to a position in a second tray, the flipping mechanism comprising: a first jaw having a surface adapted to receive the first tray; a conveyor that moves the first tray to the first jaw in a direction substantially parallel to a shortest side dimension of the first tray; a second jaw having a surface adapted to receive the second tray; a mover for moving the first jaw, the first tray, the second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and a rotator for rotating the first and second jaws. Reversal of the rejection is respectfully requested.

Claim 20

Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art in view of Jackson et al. (US 6,139,243). Applicant respectfully traverses. The Examiner has failed to show in the prior art a method for acquiring physical information associated with a plurality of devices placed in a tray, the method comprising the steps of:

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inspecting a first side of a device within a first tray; moving the first tray in a direction substantially perpendicular to a longer side of the first tray to reduce a distance of travel of the first tray to a flip station; moving a second tray to a position near the first tray; flipping the first tray and second tray to move the device from the first tray to the second tray and place the device in the second tray so that a second side of the device is presented in the second tray; and inspecting a second side of the device within the second tray. Reversal of the rejection is respectfully requested

Claims 10, 37-39

Claims 10 and 37-39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art [discussed on pages 2-5 of the specification] in view of Jackson et al. (US 6,139,243) as applied to claims 3-9, 12-21, 27-30, 40, and 42, and further in view of Bilodeau (US 5,691,810). Applicant respectfully traverses. To show obviousness under § 103, the burden is on the Examiner to show that, considering the claimed invention as a whole and considering the references a whole, that the references suggest the desirability and thus the obviousness of making the combination; further, the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention. *Hodosh, supra*. Neither Jackson, nor Applicant's discussion of the prior art, nor Bilodeau provide any prior-art recognition of a need for, or the desirability of, moving trays parallel to their short dimension rather than parallel to the long dimension of the tray. Accordingly, claims 37-39 and 10 appear in condition for allowance and reversal of the rejection is respectfully requested.

Claims 40, 41-42

Regarding claim 40 and its dependent claims 41-42, the cited references do not show a tray-transfer device combined with the other elements that moves the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long-dimension side of the tray so as to reduce the distance of movement needed. Accordingly, claims 37-39 and 10 appear in condition for allowance and reversal of the rejection is respectfully requested.

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Further, claim 40 provides a generic linking claim between independent claims 3, 12, 17, 20, 37 and independent claims 22 and 32, and dependent claim 41. Thus, claim 3 (and its dependent claims 4, 5, 6, 7, 8, 9, 10, and 27), 12 (and its dependent claims 13, 14, 15, 16 and 28), 17 (and its dependent claims 18, 19 and 29), and 20 (and its dependent claims 21 and 30); and independent claims 22 (and its dependent claims 23, 24, 25 and 31) and 32 (and its dependent claims 33, 34, 36) are linked by a generic claim 40.

Claims 43, 44-45

Regarding claim 43 and its dependent claims 44-45 and claim 46 and its dependent claims 47-48, the cited references do not show the equivalent structure for the means for inverting as recited (and combined with the other elements) and for moving the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long-dimension side of the tray. Claim 43 is a means-plus-function claim that must be examined under 35 U.S.C. § 112 paragraph 6 to cover the corresponding structure, materials or acts described in the specification and equivalents thereof. The Examiner has failed to provide any showing of structure or acts equivalent to those described in the present specification to provide the recited means. Accordingly, Applicant respectfully requests that the rejection be reversed and that these claims be allowed.

Claims 46, 47-48

Regarding claim 46 and its dependent claims 47-48, the cited references do not show the equivalent structure for the means for inverting as recited (and combined with the other elements) and for moving the devices from the first inspection station to the second inspection station in a direction not parallel to the long dimension side of the tray. Claim 46 is a means-plus-function claim that must be examined under 35 U.S.C. § 112 paragraph 6 to cover the corresponding structure, materials or acts described in the specification and equivalents thereof. The Examiner has failed to provide any showing of structure or acts equivalent to those described in the present specification to provide the recited means. Accordingly, Applicant respectfully requests that the rejection be reversed and that these claims be allowed.

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Further, claims 43 and 46 each provide a generic linking claim between independent claims 3, 12, 17, 20, 37 and independent claims 22 and 32, and dependent claims 41, 44, 45, 47, and 48. Thus, claim 3 (and its dependent claims 4, 5, 6, 7, 8, 9, 10, and 27), 12 (and its dependent claims 13, 14, 15, 16 and 28), 17 (and its dependent claims 18, 19 and 29), and 20 (and its dependent claims 21 and 30); and independent claims 22 (and its dependent claims 23, 24, 25 and 31) and 32 (and its dependent claims 33, 34, 36) and dependent claims 44, 45, 47, and 48 are linked by generic claims 43 and 46. Since the generic linking claims appear allowable as described above, reversal of the rejection and allowance of the claims are respectfully requested.

Claims 22, 44, 47

With regard to the rejection of claims 22, 44, and 47, Applicant respectfully traverses any rejection. Jackson only discusses flipping the devices from a first tray into a second tray and then passing the second tray. In such a system, any identification or markings on the first tray that are associated with a particular set or batch of devices are no longer associated with the devices once they are placed in the second tray. Neither Jackson nor the Applicant's discussion of the prior art flips the devices and then puts the devices back into the same tray. In contrast, the present Figures 19c-19g show flipping a plurality of devices and then placing them back into the same tray.

Accordingly, the claims appear to be in condition for allowance, and reconsideration and reversal of the rejections is respectfully requested.

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Conclusion

It is respectfully submitted that the claimed invention is patentable in view of the cited art. It is respectfully submitted that claims 3-10, 12-21, 27-30, and 37-48 should therefore be allowed. Reversal of the Examiner's rejections of claims 3-10, 12-21, 27-30, and 37-48 is respectfully requested.

Respectfully submitted,

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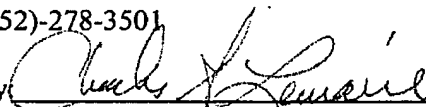
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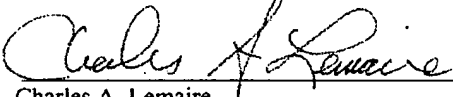
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CERTIFICATE UNDER 37 CFR 1.8(a): I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office (Fax No. (703) 872-9306) on this 19th day of May 2005.



Charles A. Lemaire

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1-2. (Cancelled)

3. (Previously presented) A machine-vision system for inspecting a device, the device having a first side and a second side, the machine-vision system comprising:

a first inspection station for inspecting a first side of a device;

a second inspection station for inspecting a second side of a device; and

a tray-transfer mechanism that operates to move the device in a tray having a long-dimension side and a short-dimension side from the first inspection station to the second inspection station in a direction substantially perpendicular to the long-dimension side, wherein the short dimension side is shorter than the long dimension side, and wherein the tray-transfer mechanism further includes an inverting mechanism that operates to invert the device so that the first side of the device can be inspected at the first inspection station and the second side of the device can be inspected at the second inspection station, wherein the inverting mechanism further comprises a mechanism for flipping the devices carried in a tray, the mechanism further comprising:

a first jaw having a surface for receiving a first tray;

a second jaw having a surface for receiving a second tray;

a mover for moving the first jaw, the first tray carrying the device, the second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and

a rotator for rotating the first and second jaws.

4. (Original) The machine-vision system of claim 3 wherein the mover moves the first jaw in a direction substantially perpendicular to the surface for receiving a tray associated with the first jaw.

5. (Original) The machine-vision system of claim 3 wherein the mover moves the first jaw and the second jaw in a direction substantially perpendicular to the surface for receiving a tray

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associated with the first jaw.

6. (Previously presented) The machine-vision system of claim 3 wherein the inverting mechanism moves the plurality of devices to the second tray such that the second sides of the plurality of devices are presented for inspection.

7. (Previously presented) The machine-vision system of claim 3 wherein the rotator of the inverting mechanism moves the plurality of devices to the second tray such that the second sides of the plurality of devices are presented for inspection.

8. (Original) The machine-vision system of claim 6 wherein the mover of the inverting mechanism is adapted to place the plurality of devices in the second tray at the second inspection station.

9. (Previously presented) The machine-vision system of claim 8 wherein the tray transfer device includes means for moving the second inspection station with respect to the inverting mechanism.

10. (Original) The machine-vision system of claim 8 further comprising a picker for picking devices which fail inspection from the second tray.

11. (Cancelled)

12. (Previously presented) A machine-vision system for inspecting a plurality of devices positioned within a plurality of device-carrying trays, the machine-vision system comprising:

- a first tray adapted to carry a plurality of devices;
- a second tray adapted to carry a plurality of devices;
- a flip station for flipping the plurality of devices carried in a first tray from a first inspection position in the first tray to a second inspection position in the second tray wherein the

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flip station further comprises:

a first jaw having a surface for receiving a first tray;

a second jaw having a surface for receiving a tray;

a mover for moving the first jaw, a first tray having a plurality of devices, a second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and

a rotator for rotating the first and second jaws; and

a mover that moves the first tray to the flip station in a direction substantially perpendicular to a longer side of the first tray to reduce a distance of travel of the first tray.

13. (Previously presented) The machine-vision system of claim 12 further comprising:

a first tray-transfer device for holding at least the first tray, said first tray-transfer device moving the first tray from the first inspection station to the flip station; and

a second tray-transfer device for holding at least the second tray, said second tray-transfer device moving the second tray from the flip station to the second inspection station.

14. (Previously presented) The machine-vision system of claim 12 wherein the flip station further comprises a mechanism for flipping the devices carried in a tray, the mechanism further comprising means for limiting the motion of the rotator.

15. (Original) The machine-vision system of claim 12 wherein the mover moves the first jaw in a direction substantially perpendicular to the surface for receiving a tray associated with the first jaw.

16. (Original) The machine-vision system of claim 12 wherein the mover moves the first jaw and the second jaw in a direction substantially perpendicular to the surface for receiving a tray associated with the first jaw.

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17. (Previously presented) A flipping mechanism for transferring a plurality of devices from a position in a first tray to a position in a second tray, the flipping mechanism comprising:

a first jaw having a surface adapted to receive the first tray;

a conveyor that moves the first tray to the first jaw in a direction substantially parallel to a shortest side dimension of the first tray;

a second jaw having a surface adapted to receive the second tray;

a mover for moving the first jaw, the first tray, the second tray, and the second jaw into engagement with each other, said first tray associated with the first jaw and the second tray associated with the second jaw; and

a rotator for rotating the first and second jaws.

18. (Previously presented) The flipping mechanism of claim 17 wherein the mover can be controlled to remove the first tray from a first inspection surface.

19. (Previously presented) The flipping mechanism of claim 17 wherein the mover can be controlled to place the second tray at a second inspection surface.

20. (Previously presented) A method for acquiring physical information associated with a plurality of devices placed in a tray, the method comprising the steps of:

inspecting a first side of a device within a first tray;

moving the first tray in a direction substantially perpendicular to a longer side of the first tray to reduce a distance of travel of the first tray to a flip station;

moving a second tray to a position near the first tray;

flipping the first tray and second tray to move the device from the first tray to the second tray and place the device in the second tray so that a second side of the device is presented in the second tray; and

inspecting a second side of the device within the second tray.

21. (Previously presented) The method of claim 20, further including the step of moving the

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second tray to a second inspection surface in a direction substantially perpendicular to a longer side of the second tray to reduce a distance of travel of the second tray from the flip station.

22. (Withdrawn) A machine-vision system for inspecting a plurality of devices and for inverting the plurality of devices from being positioned in a first tray, the machine-vision system comprising:

- a first jaw having a surface for receiving the first tray;
- a second jaw having a surface;
- a mover for moving the first jaw, the first tray having a plurality of devices, and the second jaw into engagement with each other, said first tray associated with the first jaw; and
- a rotator that rotates the first and second jaws to a position such that the devices are inverted and supported by the second jaw and are then are placed back into the first tray in the inverted position.

23. (Withdrawn) The machine-vision system of claim 22 further comprising;

- a first conveyer for moving the first tray having a plurality of devices therein to the first jaw; and
- a second conveyer for moving the first tray having a plurality of devices therein from the first jaw.

24. (Withdrawn) The machine-vision system of claim 22 wherein the first jaw is capable of holding, in any position, a tray devoid of devices.

25. (Withdrawn) The machine-vision system of claim 22 further comprising;

- a slider for transferring the inverted devices from the second jaw into the first tray.

26. (Cancelled)

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27. (Previously presented) The machine-vision system of claim 3 wherein the rotator rotates the first and second jaws simultaneously.
28. (Previously presented) The machine-vision system of claim 12 wherein the rotator rotates the first and second jaws simultaneously.
29. (Previously presented) The flipping mechanism of claim 17 wherein the rotator rotates the first and second jaws simultaneously.
30. (Previously presented) The method of claim 20, wherein moving the second tray to the position near the first tray further includes moving the second tray to engage the first tray, and wherein flipping the first tray and second tray is done simultaneously after engagement.
31. (Withdrawn) The machine-vision system of claim 22 wherein the rotator rotates the first and second jaws simultaneously.
32. (Withdrawn) A machine-vision system for inspecting a plurality of devices, each device having a first side and a second side, the machine-vision system comprising:
a first inspection station for inspecting a first side of the devices held in a tray;
a second inspection station for inspecting a second side of the devices held in the tray;
and
a tray-transfer device that operates to move the devices from the first inspection station to the second inspection station, said tray-transfer device further including an inverting mechanism that operates to invert the devices and place the devices back into the same tray so that the first side of the devices can be inspected at the first inspection station in the tray and the second side of the device can be inspected at the second inspection station in the tray.
33. (Withdrawn) The system of claim 32 wherein the tray has a long dimension side and a short dimension side, and is moved from the first inspection position to the inverting mechanism

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in a direction substantially perpendicular to the long dimension side so as to reduce the amount of movement needed.

34. (Withdrawn) The system of claim 33 wherein the inverting mechanism is positioned between the first inspection position and the second inspection position, and wherein the tray has a long dimension side and a short dimension side, and is moved from the first inspection position to the inverting mechanism and to the second inspection position in a direction substantially perpendicular to the long dimension side so as to reduce the amount of movement needed.

35. (Withdrawn) A machine-vision system for inspecting a plurality of devices positioned within a plurality of device-carrying trays, the machine-vision system comprising:

a first tray adapted to carry a plurality of devices;

a flip station for flipping the plurality of devices carried in the first tray from a first inspection position in the first tray to a second inspection position in the first tray.

36. (Withdrawn) The machine-vision system of claim 34, wherein the flip station further comprises a mechanism for flipping the devices while the devices are carried in a tray.

37. (Previously presented) A machine-vision system for inspecting a device, the device having a first side and a second side, the machine-vision system comprising:

a first inspection station for inspecting a first side of a plurality of devices;

a second inspection station for inspecting a second side of [a] the plurality of devices;

a tray-transfer device that operates to move the devices in a tray from the first inspection station to the second inspection station, said tray-transfer device further including an inverting mechanism that operates to invert the devices so that the first side of the devices are inspected at the first inspection station and the second side of the devices are inspected at the second inspection station, wherein the inverting mechanism further comprises a mechanism for flipping the devices carried in a tray, the mechanism further comprising:

a first jaw having a surface for receiving a first tray;

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a second jaw having a surface for receiving a second tray;
a mover that moves the second jaw such that the second tray comes into engagement with the first tray, said first tray associated with the first jaw and the second tray associated with the second jaw; and
a rotator for rotating the first and second jaws; and
a pick-and-place mechanism that removes rejected devices that fail an inspection at the first or second inspection station from the second tray and replaces the removed devices with good devices that passed inspection, in order to achieve an all-good tray of devices.

38. (Previously presented) The system of claim 37, wherein the first inspection station is a three-dimensional scanning station that provides height measurements for a plurality of points on a first side each device.

39. (Previously presented) The system of claim 38, further comprising a third inspection station that provides two-dimensional measurements for a plurality of points on the first side each device.

40. (Previously presented) A machine-vision system for inspecting a plurality of tray-held devices, each device having a first side and a second side, the machine-vision system comprising:
a first inspection station for inspecting a first side of the devices held in a tray that has a long-dimension side and a short-dimension side;
a second inspection station for inspecting a second side of the devices; and
a tray-transfer device that operates to invert the devices and move the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long dimension side of the tray so as to reduce the distance of movement needed.

41. (Withdrawn) The system of claim 40 wherein tray-transfer device operates to invert the devices and place the devices back into the same tray so that the first side of the devices can be

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inspected at the first inspection station in the tray and the second side of the device can be inspected at the second inspection station in the same tray.

42. (Previously presented) The system of claim 40 wherein tray-transfer device operates to invert the devices and place the inverted devices into a different tray than that used at the first inspection station.

43. (Previously presented) A machine-vision system for inspecting a plurality of tray-held devices, each device having a first side and a second side, the machine-vision system comprising:
a first inspection station for inspecting a first side of the devices held in a tray that has a long-dimension side and a short-dimension side that is shorter than the long-dimension side;
a second inspection station for inspecting a second side of the devices; and
means for inverting the devices and moving the devices from the first inspection station to the second inspection station in a direction substantially perpendicular to the long dimension side of the tray.

44. (Withdrawn) The system of claim 43, wherein the means for inverting operates to invert the devices and place the devices back into the same tray so that the first side of the devices can be inspected at the first inspection station in the tray and the second side of the device can be inspected at the second inspection station in the same tray.

45. (Previously presented) The system of claim 43, wherein means for inverting operates to invert the devices and place the inverted devices into a different tray than that used at the first inspection station.

46. (Previously presented) A machine-vision system for inspecting a plurality of tray-held devices, each device having a first side and a second side, the machine-vision system comprising:
a first inspection station for inspecting a first side of the devices held in a tray that has a long-dimension side and a short-dimension side that is shorter than the long-dimension side;

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a second inspection station for inspecting a second side of the devices; and
means for inverting the devices and moving the devices from the first inspection station to the second inspection station in a direction not parallel to the long dimension side of the tray.

47. (Withdrawn) The system of claim 46, wherein the means for inverting operates to invert the devices and place the devices back into the same tray so that the first side of the devices can be inspected at the first inspection station in the tray and the second side of the device can be inspected at the second inspection station in the same tray.

48. (Previously presented) The system of claim 46, wherein means for inverting operates to invert the devices and place the inverted devices into a different tray than that used at the first inspection station.